

EPSON[®] EL 4S/33

User's Guide



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Important Safety Instructions

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the computer.
3. Unplug the computer from the wall outlet before cleaning. Use a damp cloth for cleaning; do not use liquid or aerosol cleaners.
4. Do not spill liquid of any kind on the computer.
5. Do not place the computer on an unstable cart, stand, or table.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; do not block or cover these openings. Do not place the computer near or over a radiator or heat register.
7. Operate the computer using the type of power source indicated on its label.
8. If you plan to operate the computer in Germany, observe the following safety precaution:

To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

Beim Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

9. Connect all equipment to properly grounded (earthed) power outlets. If you are unable to insert the plug into an outlet, contact your electrician to replace your outlet. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.
10. Do not allow the computer's power cord to become damaged or frayed.

11. If you use an extension cord with the computer, make sure the total of the ampere ratings of the devices plugged into the extension cord does not exceed the ampere rating for the extension cord. Also, make sure the total of all products plugged into the wall outlet does not exceed 15 amperes.
12. Do not insert objects of any kind into this product through the cabinet slots.
13. Except as specifically explained in this User's *Guide*, do not attempt to service the computer yourself. Refer all servicing to qualified service personnel.
14. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged.
 - B. If liquid has entered the computer.
 - C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.
 - D. If the computer has been dropped or the cabinet has been damaged.
 - E. If the computer exhibits a distinct change in performance.

Instructions Importantes de **Sécurité**

1. **Lire complètement les instructions qui suivent et les conserver** pour references futures.
2. **Bien suivre tous les avertissements et les instructions indiqués sur l'ordinateur.**
3. **Débrancher l'ordinateur de toute sortie murale avant le nettoyage. Utiliser un chiffon humide; ne jamais utiliser un nettoyeur liquide ou une bonbonne aérosol.**
4. **Ne jamais renverser un liquide d'aucune sorte sur l'ordinateur.**
5. **Ne pas placer l'ordinateur sur un chariot, un support, ou une table instable.**
6. **Les événements dans les meubles, à l'arrière et en dessous sont conçus pour l'aération; on ne doit jamais les bloquer. Ne pas placer l'ordinateur près d'une source de chaleur directe.**
7. **Le fonctionnement de l'ordinateur doit s'effectuer conformément au type de source d'alimentation indiquée sur l'étiquette.**
8. **Lorsqu'on désire utiliser l'ordinateur en Allemagne, on doit observer les normes sécuritaires qui suivent:**

Afin d'assurer une protection adéquate à l'ordinateur contre les court-circuits et le survoltage, l'installation de l'édifice doit comprendre un disjoncteur de 16 amp.
9. **On doit brancher tout l'équipement dans une sortie reliée à la masse. Lorsqu'il est impossible d'insérer la fiche dans la prise, on doit retenir les services d'un électricien ou remplacer la prise. Ne jamais utiliser une prise sur le même circuit qu'un appareil à photocopie ou un système de contrôle d'aération avec commutation marche-arrêt.**
10. **S'assurer que le cordon d'alimentation de l'ordinateur n'est pas effrité.**

11. Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, on doit s'assurer que la valeur totale d'ampères branchés dans le cordon n'excède en aucun temps les ampères du cordon de rallonge. La quantité totale des appareils branchés dans la prise murale ne doit jamais excéder 15 ampères.
12. Ne jamais insérer un objet de quelque sorte que ce soit dans les cavités de cet appareil.
13. Sauf tel que spécifié dans la notice d'utilisation, on ne doit jamais tenter d'effectuer une réparation de l'ordinateur. On doit référer le service de cet appareil à un technicien qualifié.
14. Débrancher l'ordinateur de la prise murale et confier le service au personnel de service qualifié selon les conditions qui suivent:
 - A. Lorsque le cordon d'alimentation ou la prise sont endommagés.
 - B. Lorsqu'un liquide s'est infiltré dans l'ordinateur.
 - C. Lorsque l'ordinateur refuse de fonctionner normalement même en suivant les instructions. N'ajuster que les commandes qui sont énumérées dans les instructions de fonctionnement. Tout ajustement inadéquat de tout autre contrôle peut provoquer un dommage et souvent nécessiter des réparations élaborées par un technicien qualifié afin de remettre l'appareil en service.
 - D. Lorsqu'on a échappé l'ordinateur ou que l'on a endommagé le boîtier.
 - E. Lorsque l'ordinateur démontre un changement noté au niveau de sa performance.

**FCC COMPLIANCE STATEMENT
FOR AMERICAN USERS**

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☐ **Reorient or relocate the receiving antenna**
- ☐ **Increase the separation between the equipment and receiver**
- ☐ **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected**
- ☐ **Consult an experienced radio/TV technician for help.**

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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Introduction

Your new Epson® EL 4S/33 computer is a high-performance system offering flexibility and expandability in a compact design. It provides the following features:

- ❑ Cyrix® Cx486SLC™ 33 MHz microprocessor
- ❑ 2MB or 4MB of internal memory, expandable to 16MB
- ❑ System and video BIOS shadow RAM
- ❑ 256KB of on-board video memory, expandable to 512KB or 1024KB
- ❑ Built-in VGA port
- ❑ Two built-in serial ports, one built-in parallel port, and one built-in game port
- ❑ Built-in PS/2 compatible keyboard port
- ❑ Three 16-bit full-length and two 8-bit half-length ISA option slots
- ❑ Support for up to three mass storage devices.

The Cyrix Cx486SLC microprocessor is 486SX instruction set-compatible. It features a 32-bit internal/16-bit external data path and is 486SX bus-compatible. The shadow RAM feature allows your system to speed up processing by moving the system and video BIOS into the RAM area of memory.

Using the built-in interfaces, you can connect most of your peripheral devices directly to the computer so you do not have to install option cards. You can use the option slots to enhance your system with extra functions such as a modem card, a network controller card, or additional interface ports.

The VGA controller supports standard resolutions up to 640 x 480 in 16 colors and extended resolutions up to 1024 x 768 in 4 colors (interlaced or non-interlaced). With 512KB video memory, the controller supports resolutions up to 1024 x 768 in 16 colors; with 1024KB, it supports the same resolutions in up to 256 colors.

VGA Utilities

Your computer comes with special VGA drivers and utilities for use with the integrated VGA interface. With these utilities, you can take advantage of the extended VGA features such as high resolutions and 132-column text mode when you run popular application programs.

Optional Equipment

You can easily upgrade your computer by installing additional memory and a wide variety of options as described in Chapters 3 and 4.

Memory

By adding 256KB, 1MB, and 4MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 16MB.

Drives

Your system can support up to three internal mass storage devices, including hard disk drives, diskette drives, a tape drive, or a CD-ROM drive. As your storage needs expand, you can install additional drives.

Math Coprocessor

You may want to install a Cyrix Cx83S87-33 coprocessor. This optional math coprocessor allows your computer to perform mathematical functions faster.

How to Use This Manual

This manual contains the information you need to get the best results from your computer. You do not have to read everything in this book; check the following summary.

Chapter 1 provides simple instructions for setting up your system and connecting peripheral devices such as the monitor and printer. It also describes running the SETUP program to define your computer's configuration.

Chapter 2 covers general operating procedures, such as turning the computer on and off, resetting the computer, and changing the processor speed.

Chapter 3 describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as option cards and memory modules.

Chapter 4 explains how to install and remove disk drives.

Chapter 5 describes how to install VGA drivers and utilities.

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer, the software that has been tested on your system, and options available for your system.

At the end of this manual you'll find an Index.

Chapter 1

Setting Up Your System

This chapter briefly describes the operations you will use to set up your computer. It includes the following information:

- ❑ Getting started
- ❑ Connecting the computer
- ❑ Running the SETUP program
- ❑ Post-SETUP procedures.

Getting Started

Follow the instructions below for choosing a location for your new system, unpacking your system, and setting up your computer.

Choosing a Location

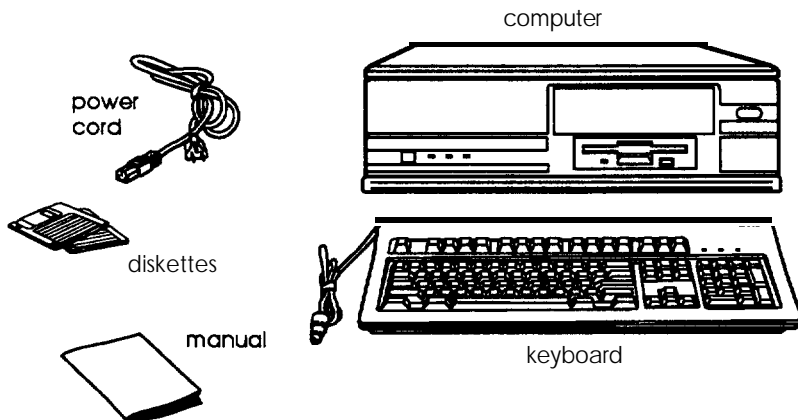
When you select a place to set up your system, choose a safe, convenient location that provides the following:

- ❑ A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.
- ❑ Good air circulation. Leave several inches of space around the computer so air can move freely.

- ❑ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other sources of heat.
- ❑ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.
- ❑ Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:

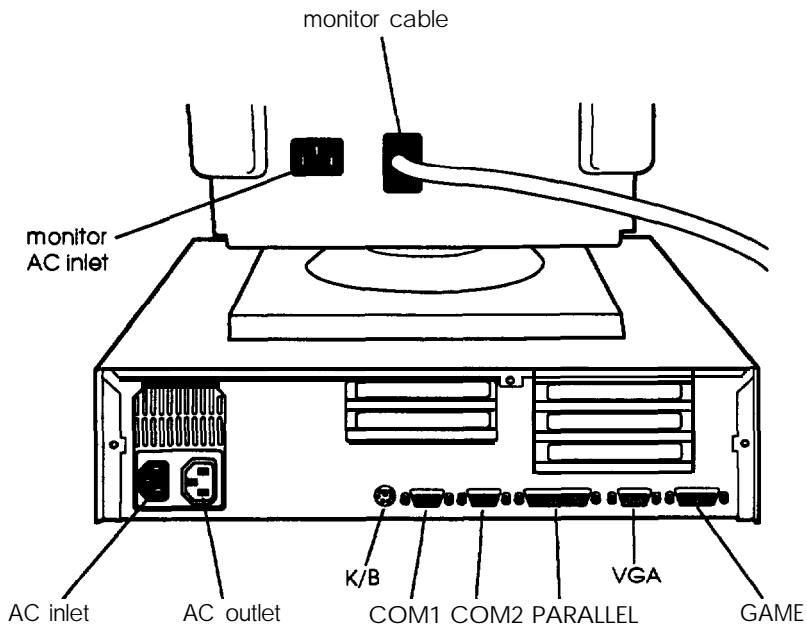


Your system also includes a serial mouse and may come with the operating system and software already installed on a hard disk drive.

If you purchased any optional equipment that goes inside the computer--such as option cards, memory modules, a hard disk, or a diskette drive--you should install these devices before you connect your computer. See Chapters 3 and 4 for instructions.

Connecting the Computer

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.



Connecting a Keyboard

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

Connecting a Mouse

Your system came with a serial mouse that connects to either of the computer's built-in serial ports. To connect the mouse, insert the connector into one of the ports marked COM1 and COM2.

When you install the drivers for your mouse, make sure you identify the port to which you connected it. See the README file on the diskette that came with your mouse for more information.

Connecting a Monitor

The way you connect your monitor to the computer depends on the type of monitor you have. If you have a VGA monitor (or a multifrequency monitor with an analog connector), you can connect it to the computer's built-in VGA port as described below. If you are connecting your monitor to an adapter card, see Chapter 3.

1. Place your monitor on top of or near the computer. Turn the monitor and computer around so the backs are facing you.
2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.
3. Examine the connector on the monitor cable and line it up with the VGA port on the computer. Then insert the connector into the port.

caution

To avoid damaging the connector, be careful not to bend the pins when you insert it.

4. If the connector has retaining screws, tighten them.
5. Plug the monitor power cord into the monitor's power inlet.
6. Plug the other end of the power cord into an appropriate grounded electrical outlet or into the power outlet on the back of the CPU.

Caution

If you plug the monitor's power cord into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp.

Connecting a Printer or Other Device

Your computer has one parallel and two serial ports. To connect a printer or other peripheral device, follow the appropriate instructions below.

Using the Parallel Port

Follow these steps to connect a parallel printer to your computer:

1. Place the printer **next** to the computer so that the backs are facing you.
2. Align the connector end of the printer cable with the **PARALLEL** port and plug it in. If the connector has retaining screws, tighten them.

3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.
4. Plug the printer's power cord into an appropriate grounded electrical outlet.

Using the Serial Ports

If you have a printer, a modem, or a mouse with a serial interface, you can connect it to one of the serial (RS-232C) ports on the back of the computer. Make sure you have a cable compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the ports marked **COM1** and **COM2**. **If you are** connecting only one serial device, use the COM1 port.

Connecting the Power Cord

Follow these steps to connect the power cord:

1. Plug the power cord into the AC power inlet on the back panel.

Warning

To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

2. Plug the other end of the power cord into an appropriate grounded electrical outlet.

Turning On the Computer

After you set up your system, you are ready to turn on the power. Follow these steps:

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.
2. If there is a protective card in the diskette drive, remove it now.
3. Turn on the monitor, printer, and any other devices connected to the computer.
4. Turn on the computer by pressing the power button on the right side of the front panel.

The screen displays a count of the system memory, and then the computer performs its power-on diagnostics, which are a series of checks that make sure everything is working correctly.

5. If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen.

If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as `C:\>` or `A:\>`.

If there is no operating system installed on your computer, you see an error message. Ignore the message for now; once you install the operating system, you will not see this message.

Now follow the instructions in the next section to configure your system using the SETUP program.

Running the SETUP Program

You need to run SETUP the first time you use your computer. Even if your system was configured for you, you may still need to set the date and time, and if your system came unconfigured, you need to define how it is set up. (You also may need to run SETUP again later if you change your configuration.)

SETUP is stored in the computer's ROM BIOS, so you can run it any time. SETUP lets you verify or change the following:

- ☐ Current date and time
- ☐ Type of diskette drive(s) and hard disk drive(s)
- ☐ System memory
- ☐ Type of video display adapter
- ☐ Keyboard options
- ☐ Processor speed
- ☐ Shadow options
- ☐ Processor chip features.

The configuration information is stored in an area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

You can run SETUP whenever you see the operating system command prompt, such as:

```
C:\> or A:\>
```

To start SETUP, hold down Ctrl and Alt, then press S.


Also, whenever you start your computer, if the system detects an error in your system configuration, you will see the following message:

Press the F1 key to continue, F2 to run the setup utility

Press F2 to run the SETUP program to correct your configuration.

The table below lists the keys you can use to perform SETUP operations.

SETUP function keys

| Key | Function |
|---|--|
| ↑ ↓ ← → | Moves the cursor to the next or previous modifiable option |
| •  | Changes the values in the field |
| PgDn PgUp | Displays the next or the previous menu |
| F1 | Displays a help screen describing the option currently selected |
| F4 | From the exit menu, saves the changes you have made and restarts your computer |
| F5 | From the exit menu, supplies the factory default values for all SETUP options |
| F6 | From the exit menu, leaves the SETUP program without saving any changes |
| Esc | Displays the exit menu |

Whenever you are in the SETUP program, the bottom of the screen lists the keys you can press to perform specific functions.

Displaying System Information

The SETUP program provides a system information screen which lists the following:

- ☐ Processor type
- ☐ Coprocessor type (if one is installed)
- ☐ Reserved memory
- ☐ BIOS version number
- ☐ Addresses for video mode, serial ports, and printer ports.

To see this information, press F2 from either of the SETUP screens. Press any key to return to the SETUP screen.

Setting the Date and Time

The real-time clock in your computer continuously tracks the date and time—even when the computer is turned off. Once you set the date and time using SETUP, you should not need to change them, unless you adjust the time for daylight savings or **other seasonal** adjustments. (The computer automatically changes the date for leap years.)

Use ↑, ↓, ← or → to move the cursor to the value you want to change. Then press + or - until you see the value you want.

Setting the Diskette Drive(s)

On your system, diskette drive A is the 3.5-inch highdensity drive installed in the lower drive bay on your system. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

Note

If you add a diskette drive and want to reassign the top drive as drive A, you must change jumpers J17 through J20, as described in Chapter 3. Then run SETUP to reassign drive types.

Setting the Hard Disk Drive(s)

The SETUP program lets you select the type of hard disk drive(s) installed in your computer. If your system was configured for you, the hard disk drive type has been preset. To set the hard disk drive type, follow these guidelines:

- ☐ If your system does not have a hard disk, select
Not Installed for Hard Disk 1 and Hard Disk 2.
- ☐ If your computer came with an Epson-installed hard disk drive, you need to define your own drive type. For more information, see "Defining your own drive type" on page 1-14.
- ☐ If you have installed another type of hard disk drive, you need to select the drive type number that matches your drive.

Hard disk drive types

The table below lists standard hard disk drives. Check this table and your drive documentation to find the correct type number. If none of the types listed matches your drive, see page 1-14.

Hard disk drive types

| Type | Cyl | Hd | Pre | LZ | Sec | Size* (MB) |
|------|------|----|-----|------|-----|------------|
| 1 | 306 | 4 | 128 | 305 | 17 | 10 |
| 2 | 615 | 4 | 300 | 615 | 17 | 20 |
| 3 | 615 | 6 | 300 | 615 | 17 | 30 |
| 4 | 940 | 8 | 512 | 940 | 17 | 62 |
| 5 | 940 | 6 | 512 | 940 | 17 | 46 |
| 6 | 615 | 4 | -1 | 615 | 17 | 20 |
| 7 | 462 | 8 | 256 | 511 | 17 | 30 |
| 8 | 733 | 5 | -1 | 733 | 17 | 30 |
| 9 | 900 | 15 | -1 | 901 | 17 | 112 |
| 10 | 820 | 3 | -1 | 820 | 17 | 20 |
| 11 | 855 | 5 | -1 | 855 | 17 | 35 |
| 12 | 855 | 7 | -1 | 855 | 17 | 49 |
| 13 | 306 | 8 | 128 | 319 | 17 | 20 |
| 14 | 733 | 7 | -1 | 733 | 17 | 42 |
| 16 | 612 | 4 | 0 | 663 | 17 | 20 |
| 17 | 977 | 5 | 300 | 977 | 17 | 40 |
| 18 | 977 | 7 | -1 | 977 | 17 | 56 |
| 19 | 1024 | 7 | 512 | 1023 | 17 | 59 |
| 20 | 733 | 5 | 300 | 732 | 17 | 30 |
| 21 | 733 | 7 | 300 | 732 | 17 | 42 |
| 22 | 733 | 5 | 300 | 733 | 17 | 30 |
| 23 | 306 | 4 | 0 | 336 | 17 | 10 |

Hard disk drive types (continued)

| Type | Cyl | Hd | Pre | LZ | Sec | Size* (MB) |
|-------|--------------------------|----|------|------|-----|------------|
| 24 | Drive table entry unused | | | | | |
| 25 | 615 | 4 | 0 | 615 | 17 | 20 |
| 26 | 1024 | 4 | -1 | 1023 | 17 | 34 |
| 27 | 1024 | 5 | -1 | 1023 | 17 | 42 |
| 28 | 1024 | 8 | -1 | 1023 | 17 | 68 |
| 29 | 512 | 8 | 256 | 512 | 17 | 34 |
| 30 | 615 | 2 | 615 | 615 | 17 | 10 |
| 31 | 989 | 5 | 0 | 989 | 17 | 41 |
| 32 | 1020 | 15 | -1 | 1024 | 17 | 127 |
| 33 | 615 | 4 | -1 | 615 | 26 | 31 |
| 34 | 820 | 6 | -1 | 820 | 26 | 62 |
| 35 | 1024 | 9 | 1024 | 1024 | 17 | 76 |
| 36 | 1024 | 5 | 512 | 1024 | 17 | 42 |
| 37 | 1024 | 5 | 512 | 1024 | 26 | 65 |
| 38 | 823 | 10 | 256 | 824 | 17 | 68 |
| 39 | 615 | 4 | 128 | 664 | 17 | 20 |
| 40 | 615 | 8 | 128 | 664 | 17 | 40 |
| 41 | 917 | 15 | -1 | 918 | 17 | 114 |
| 42 | 1023 | 15 | -1 | 1024 | 17 | 127 |
| 43 | 823 | 10 | 512 | 823 | 17 | 68 |
| 44 | 820 | 6 | -1 | 820 | 17 | 40 |
| 45 | 1024 | 5 | -1 | 1023 | 17 | 42 |
| 46 | 925 | 9 | -1 | 925 | 17 | 69 |
| 47 | 699 | 7 | 256 | 700 | 17 | 40 |
| 48,49 | User-defined drive type | | | | | |

- Actual formatted size may be slightly different than size on drive label.

Defining your own drive type

If the parameters for your hard disk (listed in its documentation) do not match any of the types listed in the table above, you can define your own type. Follow these steps:

1. Move your cursor to **Hard Disk 1** or **2** and press **+** or **-** until you see drive type **48** or type **49**.
2. Press **→** to move the cursor to the **Cyl** field.
3. Type the appropriate cylinder value for your hard disk. The documentation that came with your hard disk drive will provide the appropriate information.
4. Continue pressing **→** to move the cursor to the next field and type in the appropriate values.

If you are installing Epson-supplied drives, use the information in the following table to define your drive type.

Epson-supplied hard disk drive types

| Epson drive options | Cyl | Hd | Pre | LZ | Sec | Size* (MB) |
|---------------------|------|----|-----|------|-----|------------|
| 80MB (Conner) | 903 | 4 | 0 | 903 | 46 | 81 |
| 120MB (Conner) | 762 | 8 | 0 | 761 | 39 | 115 |
| 170MB (Conner) | 903 | 8 | 0 | 903 | 46 | 162 |
| 170MB (Quantum) | 1101 | 15 | -1 | 1101 | 22 | 170 |
| 240MB (Quantum) | 723 | 13 | -1 | 722 | 51 | 234 |

- Actual formatted size may be slightly different than size on drive label.

Note

If you are going to install NetWare 286, version 2.2, you cannot assign a user-defined drive type for your drive without installing NetWare IDE drivers. You can obtain these drivers (IDE.DSK and IDE.OBJ) by downloading IDE286.ZIP from Netware in CompuServe®. Alternatively, you can select one of the pre-defined hard disk drive types that most closely matches the drive you are installing.

Checking System Memory

Your computer comes with 2MB or 4MB of random access memory (RAM) on SIMMs. DOS and application programs that run under DOS use the first 640KB of memory. You can use the memory above 1MB as extended memory.

When you boot your system, the system BIOS detects the type of RAM and updates the base memory size and the extended memory size automatically. You see the memory configuration displayed on this SETUP screen.

Setting the Video Display Type

The Video Card option lets you define the type of adapter you are using for your primary display. If you connected your monitor to the computer's built-in VGA port, select EGA/VGA. If you installed an optional video card, follow the guidelines below to select the correct adapter type.

Video display type options

| Select | If |
|---------|--|
| EGA/VGA | You connected your monitor to the built-in VGA port or you installed a VGA or enhanced graphics adapter (EGA) card |
| CGA40* | You installed an optional color graphics adapter set to 40-column color graphics adapter (CGA) mode |
| CGA80* | You installed a CGA of a multi-mode graphics adapter (MGA) attached to a color monitor |
| MONO' | You installed a monochrome display adapter or an MGA attached to a monochrome monitor |

- For these options, you must change jumpers J36 and J37 on the system board to the OFF position.

Note

If you are installing a monochrome monitor, you also need to set jumper J11 on the main system board to position 2-3. See Chapter 3 for more information on setting jumpers.

Setting Keyboard Options

Two options in the SETUP program allow you to control keyboard settings. The **Keyboard** option allows you to disable the built-in keyboard connector if you are using an optional connector.

The **NumLock on at boot** option determines the initial state of the num lock function when you turn on or reset your system. When num lock is off, the keypad controls cursor movement. If num lock is on, the keypad types numbers.

Select **YES** to set the num lock function on when the system starts.

Setting the Processor Speed

The **CPU Speed** option sets the processor speed to fast or slow. At fast speed, your processor operates at its fastest speed, 33 MHz. At the slow speed setting, the processor operates at 8 MHz to provide compatibility with older application programs.

Cyrix Cache Option

The Cyrix Cx486SLC microprocessor includes a **1KB** internal cache. Leave this option set to **Enabled**.

Setting Chip Set Feature Control Options

The second screen of the SETUP program contains the options related to the features on your system board. Press **PgUp** or **PgDn** to display this screen.

Relocating memory

The Relocate memory option relocates the memory between A0000h to BFFFFh and D0000h to EFFFFh for use as extended memory. If you enable shadowing, however, relocation is automatically disabled.

Shadow RAM options

Your computer can access RAM (random access memory) faster than ROM (read only memory).

Two shadow features (Shadow BIOS ROM and Shadow Video ROM) allow your system to copy the contents of its system and/or video ROM into RAM so it can perform certain operations faster.

You can also shadow 32KB or 64KB of memory that starts at the indicated addresses to RAM. If you enable **these** options, you cannot use the Relocate Memory feature.

Additional options

Two additional chipset feature options allow you to slow down your system in case you need compatibility with slower option cards or diskette drives.

If you enable the ISA 1 wait state option, the system inserts one wait state in a 16-bit ISA cycle rather than providing the fastest processing at zero wait states.

The Slow Refresh option, when enabled, improves system performance because it shortens the time needed for each refresh cycle.

Exiting the SETUP Program

When you leave the SETUP program, you can save your settings and reboot your system, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave the SETUP program, press Esc from any SETUP screen. From the SETUP exit menu, press these keys to perform the following functions:

- ESC** Returns to the SETUP utility
- F4** Saves the changes you have made to your configuration and restarts your computer
- F5** Supplies the factory default values for all SETUP options
- F6** Exits the SETUP utility and returns to the system prompt without saving any changes.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer. See your operating system manual for instructions.

Also, install **any** software you plan to use. See your application program manuals for instructions.

You may also want to install the optional extended video drivers for some of your application programs. See Chapter 5 for more information.

Chapter 2

Using Your Computer

This chapter briefly describes the following operations:

- ❑ Turning the computer on and off
- ❑ Inserting and removing diskettes
- ❑ Stopping a command or program
- ❑ Resetting the computer
- ❑ Changing the processor speed.

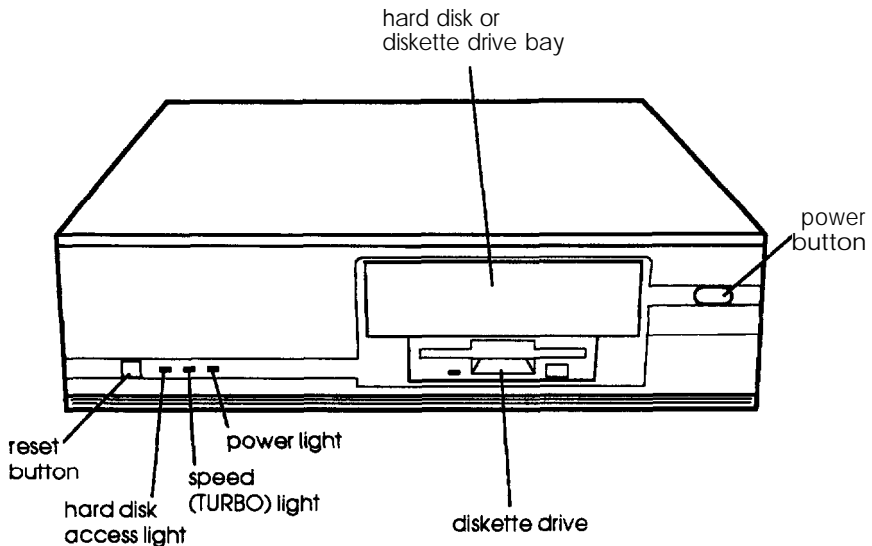
Turning On the Computer

Before you turn on your computer, check the following safety rules to avoid accidentally damaging your computer or injuring yourself:

- ❑ Do not connect or disconnect any peripheral device cables (including the keyboard or a mouse) or power cables when the computer's power is on.
- ❑ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on the disk.
- ❑ Always wait at least 20 seconds after you turn off the power before you turn it on again. This prevents possible damage to the computer's electrical circuitry.
- ❑ Do not leave a beverage near your system. Spilled liquid can damage the circuitry of your equipment.

Follow these steps to turn on your system:

1. Turn on the monitor, printer, and any other peripheral devices connected to the computer.
2. If you do not have a hard disk with an operating system loaded on it, insert your main operating system diskette in drive A.
3. To turn on the computer, press the power button located on the right side of the front panel, as shown below.



The power indicator lights up. After a few seconds, the computer displays a count of its system memory, and then performs its power-on diagnostics. This is a series of checks the computer runs each time you turn it on to make sure everything is working correctly.

When **the** system has successfully completed its diagnostics, DOS prompts you to verify the correct date and time. If they **are correct**, press **Enter**. Otherwise, enter the current date and time. If your system is configured to automatically start Microsoft Windows or has a different operating system, you may not see this prompt.

What happens next depends **on how** your computer is set up. If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If **not**, you may see the operating system prompt, such as `C : \>` or `A: \>`.

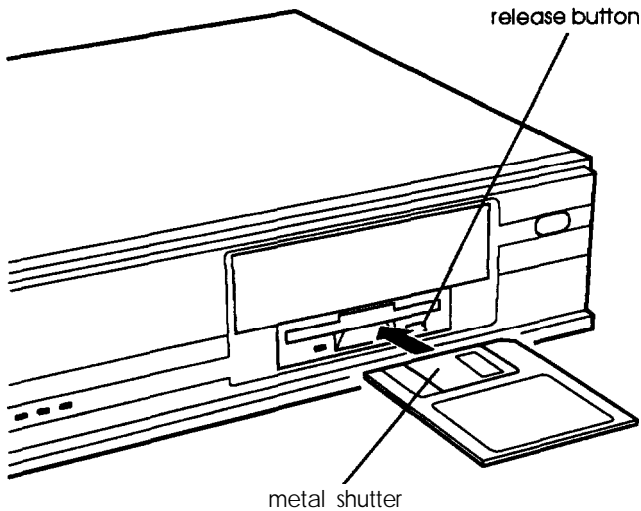
Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.
2. Check the hard disk drive light and the diskette drive light(s) to make sure they are **not on**. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.
3. Remove any diskette(s) from **the** diskette drive(s).
4. Press the power button to turn off the computer and then turn off the monitor, printer, and any other peripheral devices.

Inserting and Removing Disks

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the metal shutter leading into the drive, as **shown** in the following illustration. Slide the diskette into the drive until it clicks into place.



To insert a diskette into a 5.25-inch drive, hold **the** diskette with **the** label facing up and **the** read/write slot leading into the drive.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

Caution

Never remove a diskette or reset or turn off the computer **while a diskette drive light is on**. You could lose data. Also, remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command that you want to stop, try one of the following:

- ☐ Press **Pause**
- ☐ Hold down Ctrl and press C
- ☐ Hold down Ctrl and press **Break**

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's current settings or its memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does **not** respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only if necessary.

Caution

Do not reset the computer to exit a program. Some programs classify and store new data when you exit them in the normal manner. If you reset the computer without properly exiting a program, you may lose data.

To reset the computer, the operating system must be either on the hard disk or on a diskette in drive A; so if you do not have a hard disk, insert the system diskette in drive A. Press the **RESET** button located on the front left side of your computer. If you are using DOS, you can also hold down **Ctrl** and **Alt** and press **Del**. The screen displays nothing for a moment and then the computer should reload your operating system.

If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If you do not have a hard disk, insert the system diskette in drive A. Then turn on the computer.

Changing the Processor Speed

Your computer's processor can operate at two speeds: high speed (33 MHz) or low speed (8 MHz). The low speed is available to provide compatibility with older application programs.

When your computer **is** operating at high speed, the **TURBO** light on the front panel is on. When the computer is operating at low speed, the light is off.

You should use high speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Some copy-protected programs require **the** computer to run at low speed while accessing the program on a diskette. These programs also usually require you to leave a key disk-the diskette that contains the copy protection-in the diskette drive. If you use a copy-protected program, you can change **the** speed to low to access the diskette and return it to **high speed when you are finished.**

You can **change** the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard:

- ❑ To **select** low speed, press **Ctrl Alt -**. (Hold down the **Ctrl** key and the **Alt** key simultaneously and then press the **-** key on the numeric keypad.) The speed light turns off.
- ❑ To select **high** speed, hold down **the Ctrl** and **Alt** keys and press **+** on the numeric keypad. The speed light comes on.

Note

You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed. You can, however, change the processor speed through the SETUP program.

The speed setting remains in effect until you do the following:

- ❑ Reset your computer
- ❑ Turn off your computer
- ❑ Change the speed with another keyboard command
- ❑ Change the speed setting in the SETUP program.

Chapter 3

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as memory modules, option cards, or a math coprocessor.

Memory modules-also called SIMMs (single inline memory modules)-allow you to increase the amount of memory in your computer.

An option card is a circuit board you install in your computer to add a particular function, such as a modem or an additional interface port.

The math coprocessor can be installed on the system board to enhance numeric-intensive operations for software that supports the coprocessor.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

- ❑ Locating the internal components
- ❑ Changing the jumper settings
- ❑ Installing and removing memory modules (SIMMs)
- ❑ Installing and removing option cards
- ❑ Adding video memory
- ❑ Installing the math coprocessor.

Caution

Never install options or change jumper settings with the computer turned on or the power cord connected to the computer.

Once you have installed your option, see “Post-installation Procedures” on page 3-20.

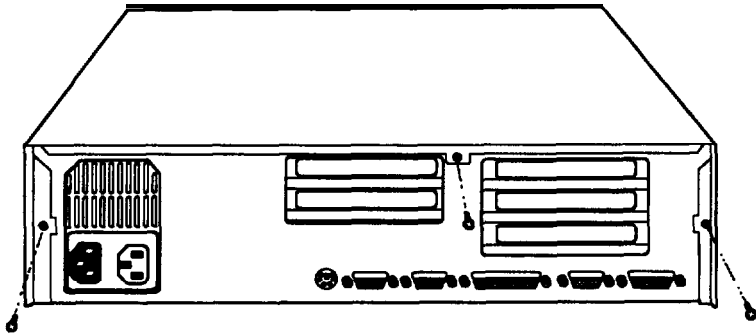
Removing and Replacing the Cover

You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 4).

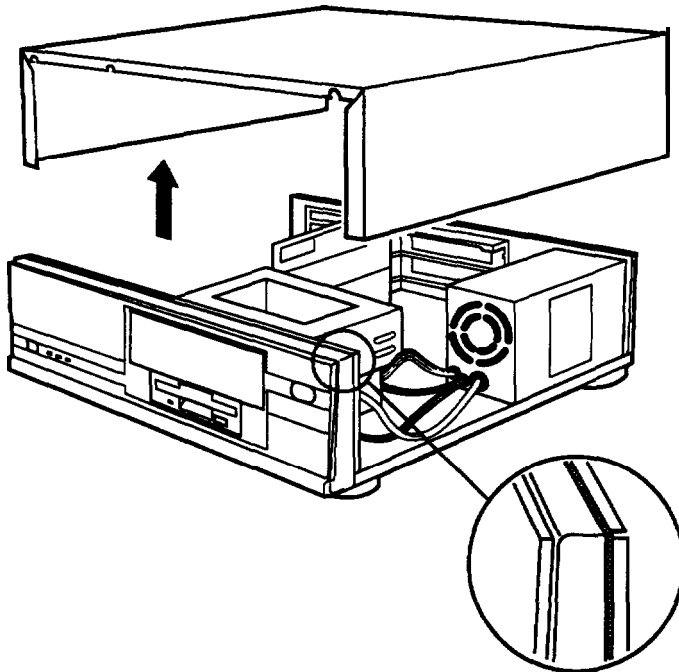
Follow these steps to remove the cover:

1. Turn off the computer and then any peripheral devices (including the monitor and printer).
2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any cables that are connected to the computer, including the keyboard cable.
3. If the monitor is on top of the computer, lift it off and set it to one side.
4. Turn the computer around so the back panel is facing you.

5. Remove the three screws securing the back panel, as shown below.



6. Grasp the sides of the cover and lift it straight up, as shown below:



7. Set the cover aside.
8. Ground yourself to the computer by touching the metal surface of the back panel.

Warning

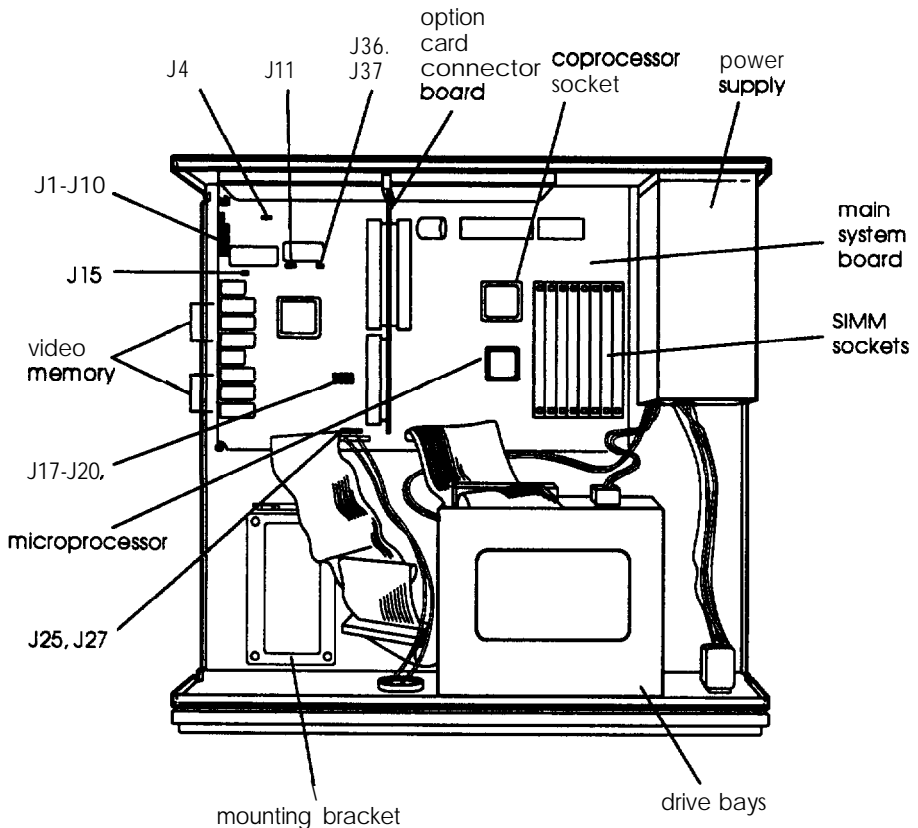
Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.
2. Check all cable connections, especially those that might have been loosened during your work.
3. Make sure all cables are out of the way so they do not catch on the cover.
4. Insert the front of the cover between the front bezel and the chassis of the computer and guide it straight down.
5. Replace the three cover retaining screws.
6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

Locating the Internal Components

As you follow the instructions in this chapter, refer to the following illustration to locate the different components inside your computer.



Changing the Jumper Settings

The main system board in your computer has a number of jumpers which control certain functions. These jumpers are preset at the factory to default positions; however, you can use the information in the following tables to change their function, if necessary:

Port jumper settings

| Jumper number | Jumper setting | Function |
|----------------------|-----------------------|--|
| J8 | 1-2* 2-3 | Enables COM1 serial port Disables COM1 serial port |
| J10 | 1-2* 2-3 | Assigns COM1 serial port as COM1 Assigns COM1 serial port as COM3** |
| J2 | 1-2* 2-3 | Enables COM2 serial port Disables COM2 serial port |
| J3 | 1-2* 2-3 | Assigns COM2 serial port as COM2 Assigns COM2 serial port as COM4** |
| J7 | 1-2* 2-3 | Enables parallel port Disables parallel port |
| J9 | 1-2* 2-3 | Assigns parallel port as LPT1 Assigns parallel port as LPT2** |
| J4 | 1-2* 2-3 | Enables game port Disables game port |

- . Factory setting
- . * DOS automatically reassigns parallel and serial ports. Check your DOS manual for more information.

Drive assignment jumper settings

| Drive assignment | J17 | J18 | J19 | J20 |
|-------------------------|------------|------------|------------|------------|
| Upper drive is A | 2-3 | 2-3 | 2-3 | 2-3 |
| Lower drive is A | 1-2* | 1-2* | 1-2* | 1-2 |

- * Factory setting

Diskette drive controller jumper settings

| Jumper number | Jumper setting | Function |
|---------------|----------------|---|
| J27 | 1-2* 2-3 | Enables diskette drive controller Disables diskette drive controller |

* Factory setting

Hard disk drive controller jumper settings

| Hard disk controller | J25 | J22** |
|----------------------|------|-------|
| Enable | 1-2* | On' |
| Disable | 2-3 | Off |

* Factory setting

** Two-pin jumper

Display adapter jumper settings

| Jumper number | Jumper setting | Function |
|---------------|----------------|---|
| J11 | 1-2* 2-3 | Color VGA display adapter Monochrome display adapter |
| J15** | On Off | Interlaced mode Non-interlaced mode |

. Factory setting

. * Two-pin jumper

Built-in VGA jumper settings

| Built-in VGA | J36** | J37** |
|--------------|-------|-------|
| Enable | On' | On' |
| Disable | Off | Off |

* Factory setting

** Two-pin jumper

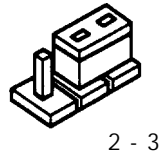
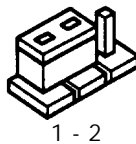
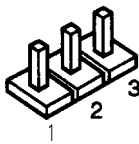
Note

To use an external display adapter in an expansion slot, you must disable the built-in VGA adapter.

Setting the Jumpers

If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 3-5 to locate the jumpers.
2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 3-16.
3. A jumper's setting is determined by where the jumper is placed on the pins. A two-pin jumper either connects both pins (on) or sits on just one of the pins (off). For three-pin jumpers, the jumper connects pin 1 and the middle pin (position 1-2) or pin 3 and the middle pin (position 2-3), as shown below.



To move a jumper from one position to the other, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

Caution

Be careful not to bend the jumper pins or damage any surrounding components on the main system board.

4. Replace any option cards you removed. See page 3-13 for instructions.

Installing Memory Modules (SIMMs)

Your computer comes with 2MB or 4MB on SIMMs. By installing additional memory modules, you can increase the amount of memory in your computer up to 16MB.

There are eight SIMM sockets on the main system board, and each can contain one memory module. You can install 256KB, 1MB, and 4MB SIMMs.

The following table shows the possible SIMM configurations; do not install memory in any other configuration. The label on the system board for each SIMM socket (**RAM1** through **RAM8**) identifies the bank of sockets where you should install SIMMs.

SIMM configurations

| Bank 0 (RAM5 and RAM6) | Bank 1 (RAM7 and RAM8) | Bank 2 (RAM1 and RAM2) | Bank 3 (RAM3 and RAM4) | Total memory |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------|
| 256KB | 256KB | 256KB | 256KB | 2MB |
| 1MB | | | | 2MB |
| 256KB | 1MB | 256KB | | 3MB |
| 1MB | 1MB | | | 4MB |
| 256KB | 1MB | 256KB | 1MB | 5MB |
| 1MB | 1MB | 1MB | | 6MB |
| 1MB | 1MB | 1MB | 1MB | 8MB |
| 4MB | | | | 8MB |
| 1MB | 4MB | 1MB | | 12MB |
| 4MB | 4MB | | | 16MB |

Before you install SIMMs, check the following guidelines to ensure that they will work properly:

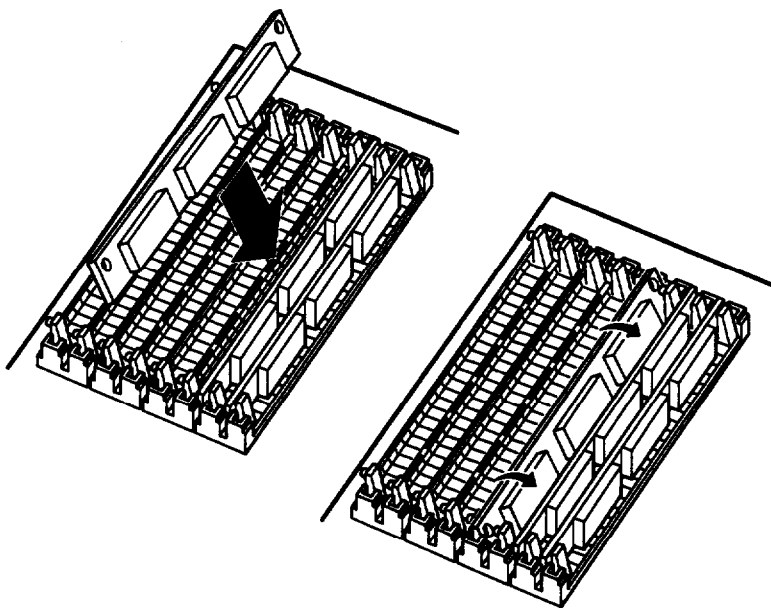
- ❑ Use only 30-pin, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.
- ❑ Use the correct SIMM configuration to add the amount of memory you want. See the table above.

Inserting SIMMs

Follow these steps to install SIMMs:

1. Refer to the illustration on page 3-5 to locate the SIMM sockets near the front of the computer.
2. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-16 for instructions.)

3. Position the first SIMM at an angle over the first empty socket in the bank you are filling, as shown below. The components on the SIMM should face the inside of the computer.

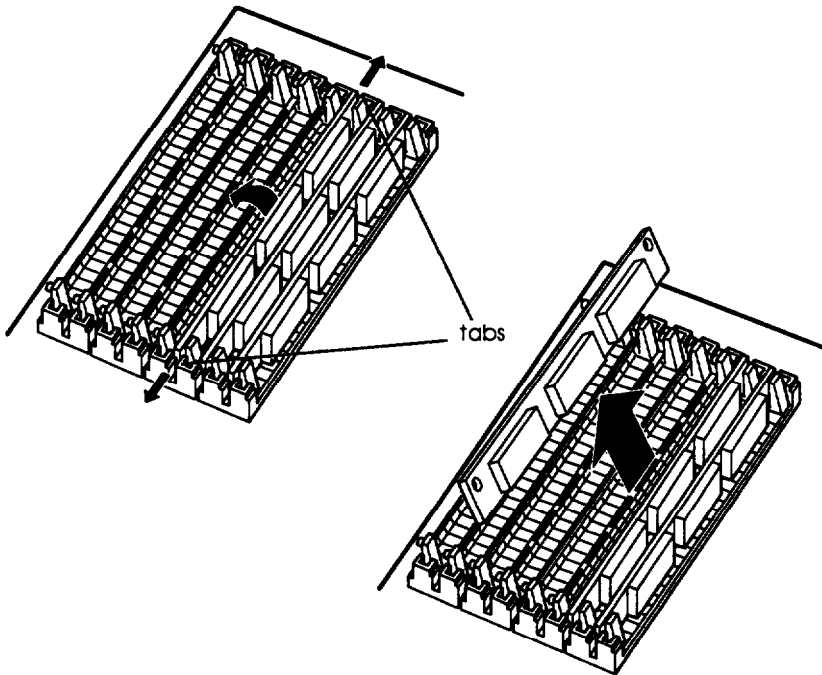


4. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown above, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.
5. Repeat steps 3 and 4 for each additional SIMM.
6. Replace any option cards you removed. (See page 3-13 for instructions.)

Removing SIMMs

If you need to remove SIMMs from your computer (to install different ones, for example), follow the steps below:

1. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-16 for instructions.)
2. Use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end, as shown below. As you pull away the tabs, the SIMM falls to the side. Remove it from the socket.



3. If necessary, follow the same procedure to remove the other SIMMs.
4. Replace any option cards you removed, as described below.

Installing an Option Card

This section explains how to install option cards in your computer. Your computer has three 16-bit full-length slots and two 8-bit half-length slots to accommodate a total of five option cards.

Usually it does not matter which slot an option card occupies as long as the card fits in the slot. For example, you can place some 8-bit cards in a 16-bit slot. However, you cannot install a 16-bit card in an 8-bit slot.

Caution

Make sure the power requirements for the option cards you install do not exceed the power supply limitations. See your option card manual(s) for the power requirements. Then check Appendix A for the option slot power limits. Note that older option cards that require -5 volts are not supported.

Before you install an option card, see if you need to change any jumper settings on the system board. For example, if you install a video card, you may need to change jumpers J11, J15, or J36 and J37. See page 3-6 for more information on jumpers.

Refer to the illustration below and follow these steps to install an option card:

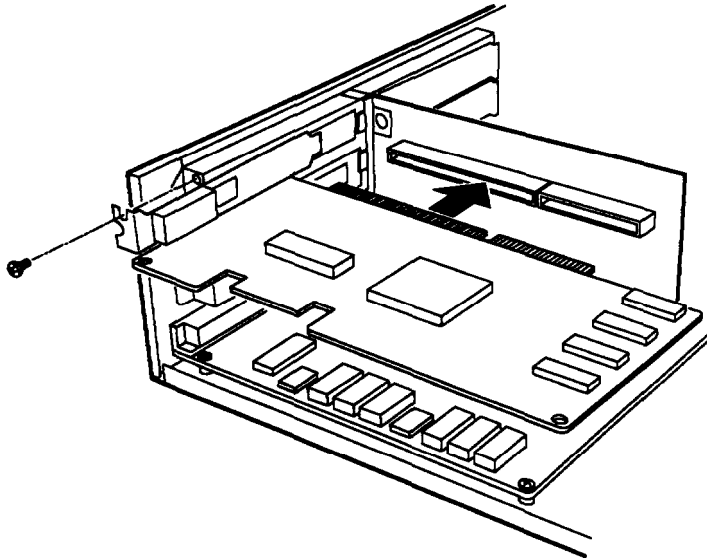
1. If you are using a 16-bit option slot, go on to step 2.

If you are using an 8-bit slot near the power supply, you need to remove the power supply before you can remove the metal slot cover.

Remove the two retaining screws securing the power supply to the back of the computer and the third retaining screw holding the power supply to the base of the computer. Be careful not to disconnect any of the cables. Slide the power supply out of the way.

2. Remove the retaining screws securing the option slot cover to the computer. (Keep the screw to secure the option card to the computer.)
3. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)
4. Unpack the option card and adjust any switches or jumpers on it, if necessary. (Check the option card instructions.) When you handle the card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.

5. Hold the card along the top corners and guide it into the connector, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)



Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

6. Secure the end of the card to the computer with the retaining screw.

Removing an Option Card

You may need to remove an option card installed in your computer to access components on the main system board-to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.
2. Set the card aside with the component side facing up.

Adding Video Memory

Your computer comes with 256KB of video memory. You can increase your video memory to either 512KB or 1024KB by installing four or six video DRAM, 20-pin, 70ns or 80ns, 44256 DIP (Dual Inline Package) chips. This is useful for running graphics-intensive applications or for supporting resolutions up to 1024 x 768 on your monitor. See Appendix A for a table identifying supported colors and resolutions for each amount of video memory.

For the memory to work properly, you must install chips in the following configuration (each bank contains two video memory chips).

Video memory chip configuration

| Bank 0 | Bank 1 | Bank 2 | Bank 3 | Total memory |
|----------|--------|--------|--------|--------------------|
| Soldered | | | | 256KB [*] |
| Soldered | Filled | | | 512KB |
| Soldered | Filled | Filled | Filled | 1024KB |

- . Standard video memory

1. Locate the memory chip sockets on the main system board, shown on page 3-5.

Bank 0 (labeled **U24** and **U40**) contains two chips soldered to the system board, so you cannot add video memory in this bank. Bank 1 (**U25** and **U41**) contains the two sockets closest to the soldered chips. Bank 2 (**U32** and **U46**) is the two middle sockets in each set of three and Bank 3 (**U33** and **U47**) contains the remaining two sockets.

2. If there is an option card in your way, remove it. See page 3-16 for instructions.

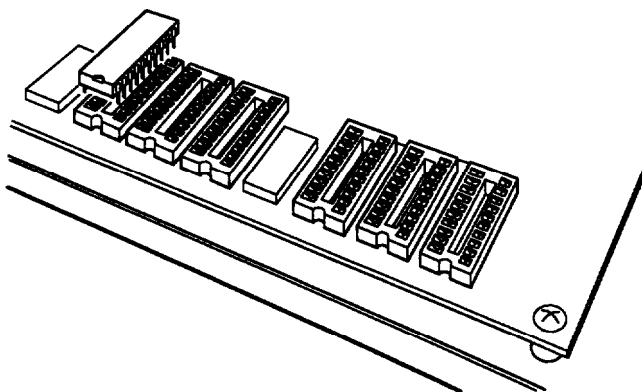
Caution

To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. The pins should point inward at slightly less than a 90° angle.

If any of the pins are bent, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the memory chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip is facing the outside of the computer.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and try again.
6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.
7. Repeat steps 4 through 6 for each of the remaining chips.
8. Replace any option cards you removed. See page 3-13 for instructions.

When you start your computer, it displays the video memory briefly before it begins its memory test.

Installing the Math Coprocessor

You can enhance your system's performance for some applications by installing a Cyrix Cx83S87-33 math coprocessor.

To install the math coprocessor, follow the instructions in the manual that came with it or follow these steps:

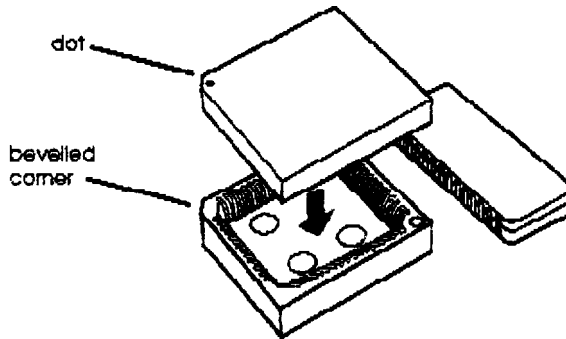
1. Locate the socket for the math coprocessor. See page 3-5.
2. If there is an option card in your way, remove it. See page 3-16 for instructions.

Caution

Before you remove the math coprocessor from its antistatic packaging touch an unpainted metal surface on the computer chassis. Do not touch the pins on the coprocessor. Handle the coprocessor only by the edges of its case.

3. Remove the coprocessor from its package and inspect it. If the pins appear bent, do not install the coprocessor.

4. Position the coprocessor over the socket as shown below. Align the notched corner of the coprocessor (marked with a dot) over the bevelled corner in the socket.

**Caution**

Be sure to align the pins in the coprocessor directly over the holes in the socket. If you insert the math coprocessor in the wrong position, you could permanently damage it.

5. Make sure the pins in the coprocessor are directly over the holes in the socket. Then gently push the coprocessor straight into the socket, pressing evenly on all sides.
6. Replace any option cards you removed. See page 3-13.

Post-Installation Procedures

After you install or remove options such as memory modules or a math coprocessor, you must run SETUP to update the computer's configuration. See Chapter 1 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment

Chapter 4

Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, or a CD-ROM drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to three mass storage devices. You can install a hard disk drive in the internal hard disk drive bay. In the upper horizontal bay, you can install a second hard disk drive (if you have the right cable), a second diskette drive, a tape drive, or a CD-ROM drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 3. Then use the instructions below to install a hard disk drive in the internal hard disk drive bay or follow the instructions on page 4-11 to install any type of drive in the upper horizontal bay.

If you are installing or removing a non-Epson drive, some of the steps in this chapter may not apply; see the documentation that came with your drive for more information.

Installing a Hard Disk Drive in the Internal Drive Bay

Your computer may have a hard disk drive already installed using the hard disk drive mounting bracket. If not, you can install a 1-inch (third-height), 3 ½-inch wide drive below the mounting bracket or above it.

Here you will find steps for the following procedures:

- ☐ Removing the mounting frames from the hard disk drive (if necessary)
- ☐ Connecting the hard disk drive cables
- ☐ Installing the hard disk drive under the mounting bracket (for third-height drives)
- ☐ Installing the hard disk drive on the mounting bracket.

Note

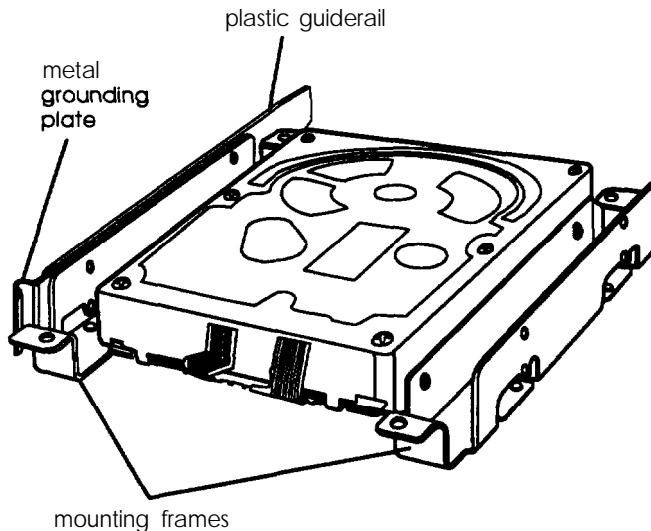
Be sure to check the jumper settings on the drive before you install a hard disk drive. Also, you will need to know the number of cylinders, heads, sectors, etc. to select the correct drive type in the SETUP program. See the documentation that came with your drive for this information.

Before you can install a hard disk drive, you need to remove any option cards that may be blocking your access to the hard disk drive area. Once you have installed the drive, replace any option cards you removed. See Chapter 3 for instructions.

Removing the Mounting Frames

If there are mounting frames attached to your hard disk drive, you need to remove them before you can install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate **attached** to **one** of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.



2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

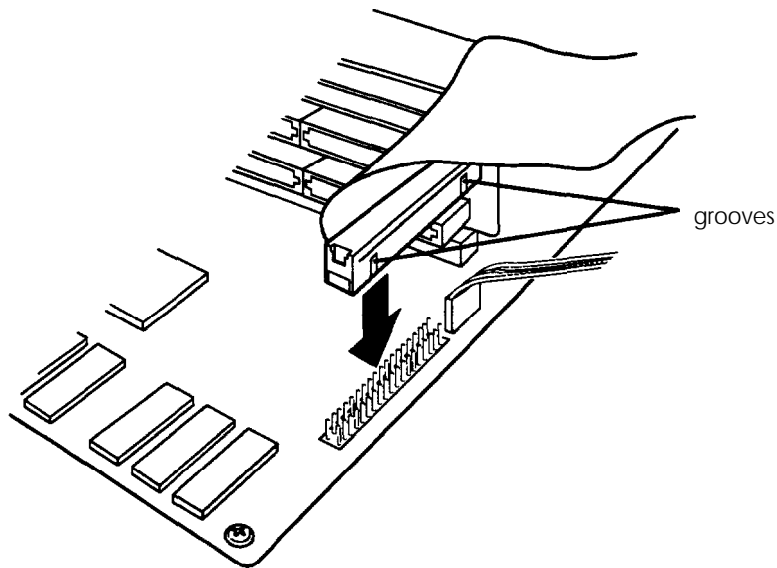
Connecting the Hard Disk Drive Cable

To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable. You should connect these cables before you secure the drive with **the** mounting bracket because you will not be able to attach them once the bracket is in place.

Connecting the Drive Cable to the System Board

If you need to connect the hard disk drive ribbon cable to the system board, follow the steps below. (If the hard disk drive ribbon cable is already attached to the system board, refer to “Connecting the Drive and Power Cables to the Drive” on page 4-5.)

1. Locate the hard disk drive connector on the system board.



2. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end.
3. Select one of the connectors. Notice the two grooves in one side of the connector. Align the connector so that these grooves face the hard disk drive bay.
4. Make sure the holes in the cable connector fit over the pins in the system board connector; then push in the cable connector.

Caution

If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Connecting the Drive and Power Cables to the Drive

Follow the steps below to connect the hard disk drive ribbon cable and a power supply cable to the drive:

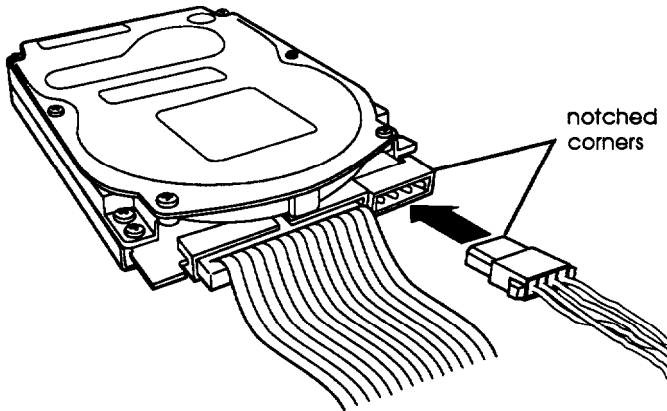
1. Locate the free connector on the end of the hard disk drive ribbon cable.
2. Locate pin 1 on the drive connector. If you do not see it on the connector casing, turn the drive over so you can see the drive's circuit board. You will see a 1 or 2 printed on the board to identify the side of the connector containing pin 1.
3. Align the connector on the cable so that the red wire will be closest to pin 1 on the drive.
4. Make sure the holes in the cable connector fit over all the pins in the hard disk drive connector; then push in the **connector**.

Caution

If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

5. Locate one of the power supply cables that lead from the power supply. (They have multicolored wires and a plastic connector on the end.)

6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive.



7. Make sure the holes fit over all the pins and then push in the **connector**.

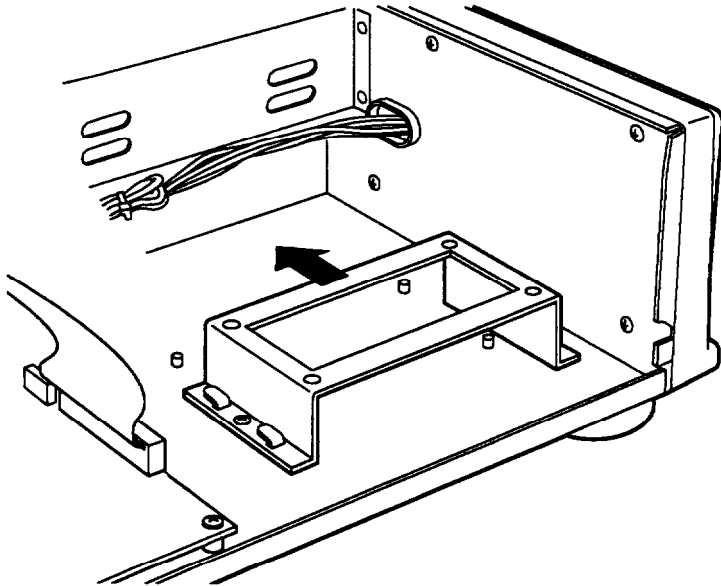
Caution

If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Installing the Hard Disk Below the Mounting Bracket

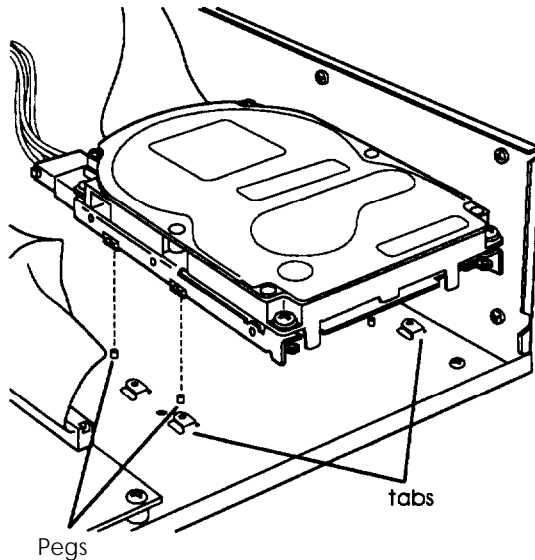
If you have a third-height hard disk drive, you can install it below the hard disk drive mounting bracket. Refer to the illustrations below and follow these steps:

1. Remove the screw securing the mounting bracket to the base of the computer.
2. Slide the mounting bracket toward the diskette drive bays until the slots clear the tabs.



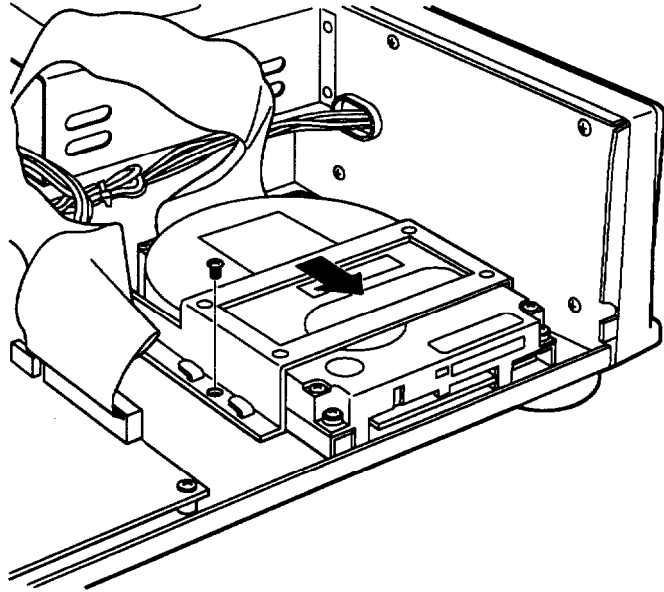
3. Lift the mounting bracket out of the computer and set it aside.

4. Align the hard disk drive so that the cable connectors are facing the diskette drive bays and the four holes at the base of the drive are above the four pegs, as shown below.



5. Gently lower the drive over the pegs. When the hard disk drive is resting on the pegs, it will not move from side to side.
6. Lower the mounting bracket over the hard disk drive, making sure that the tabs on the computer align with the slots in the mounting bracket.

7. Slide the bracket toward the side of the computer until the tabs hold the bracket secure.



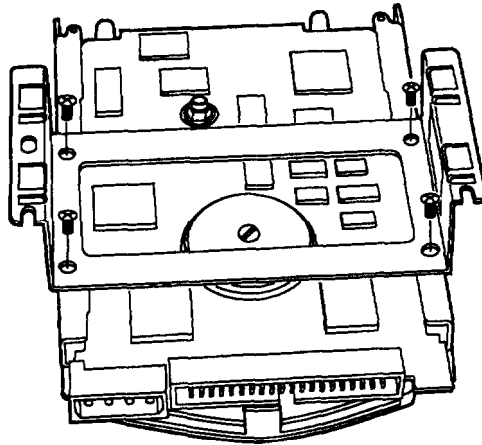
8. Secure the mounting bracket with the screw, as shown above.

Installing the Hard Disk On the Mounting Bracket

You can also install a hard disk drive on top of the mounting bracket rather than under it. Refer to the illustration on page 4-7 and the one below while following these steps:

1. Remove the screw securing the mounting bracket to the base of the computer.
2. Slide the mounting bracket toward the diskette drive bays until the slots clear the tabs.

3. Lift the mounting bracket out of the computer.
4. Turn the hard disk drive over and locate the four mounting holes on the drive.
5. Position the bracket on the hard disk drive, aligning the holes in the bracket with the holes on the drive.



6. Secure the bracket to the drive with four screws.
7. Lower the slots on the mounting bracket onto the tabs on the computer.
8. Slide the bracket toward the side of the computer until the tabs hold the bracket secure.
9. Secure the mounting bracket with the screw.

Removing a Hard Disk Drive From the Internal Drive Bay

To remove a hard disk drive, reverse the installation steps outlined above. Then disconnect the hard disk drive ribbon cable and the power supply cable from the back of the drive. When you disconnect the cables, grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. Use the screw to again secure the hard disk drive mounting bracket to the base of the computer.

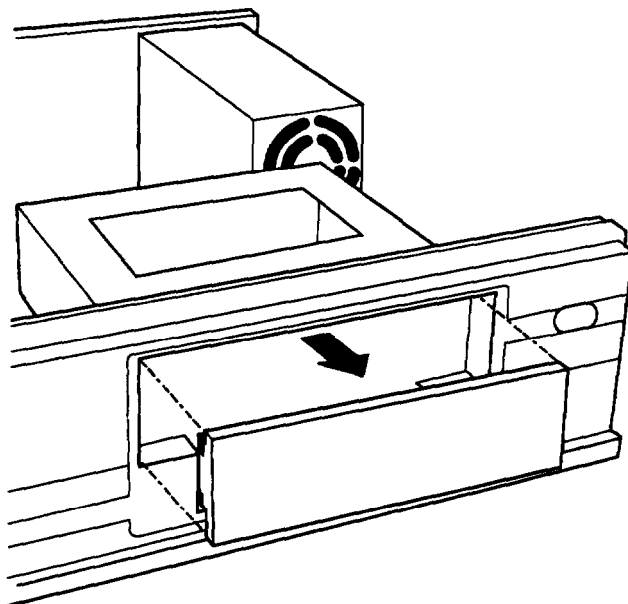
Installing a Drive in the Upper Horizontal Drive Bay

Your system comes with a 3.25-inch diskette drive installed in the lower horizontal drive bay. You can also install a diskette drive, a CD-ROM, a tape drive, or a second hard disk drive in the upper horizontal drive bay. If you install a second hard disk drive in this bay, make sure you purchase the appropriate cable to connect both drives to the hard disk drive connector.

Before you install a drive in the upper drive bay, remove the cover. Once you have the drive installed, replace the cover, following the instructions in Chapter 3.

Follow these steps to install a drive in the upper horizontal drive bay:

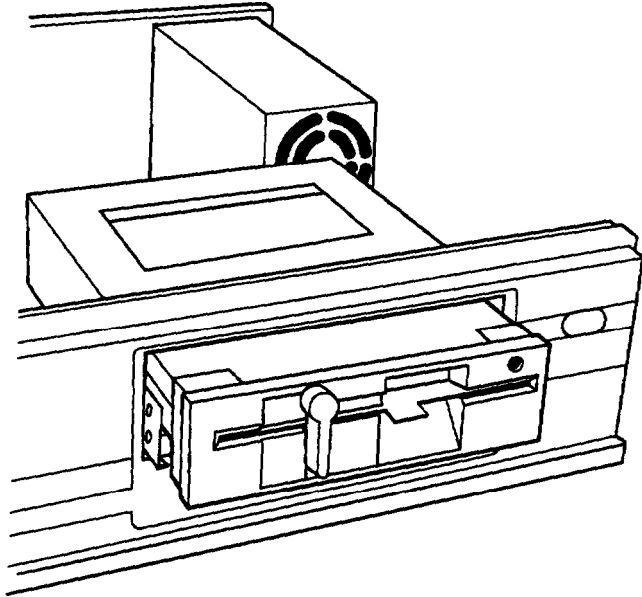
1. Remove the faceplate from the bay. Place your hand behind the plate through the hole in the drive bay, and push the faceplate forward, as shown below.



Keep the faceplate in a safe place in case you remove a drive later.

2. Remove any brackets or mounting frames from the drive.

3. Slide the drive into the bay as far as it will go.

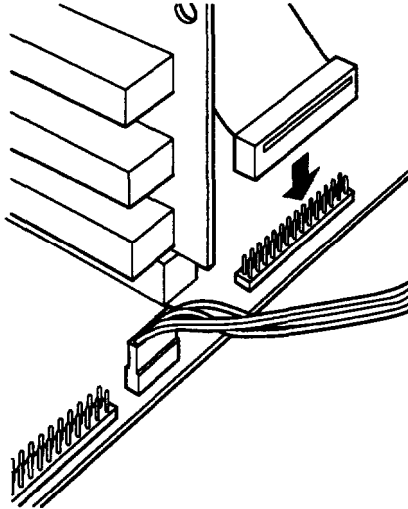


4. The side of the drive bay contains slots that correspond to the mounting holes in the drive. Secure the drive using retaining screws in both sides of the drive.

Connecting the Drive and Power Cables

To connect the drive to the computer, you need to connect both the drive ribbon cable and a power supply cable. Follow the steps below.

1. If you are installing a diskette drive, locate the diskette drive ribbon cable. The middle of the cable is connected to the system board.



If you are installing a second diskette drive, one end of the cable is connected to the bottom diskette drive. The cable contains both a card-edge connector and a header **connector**.

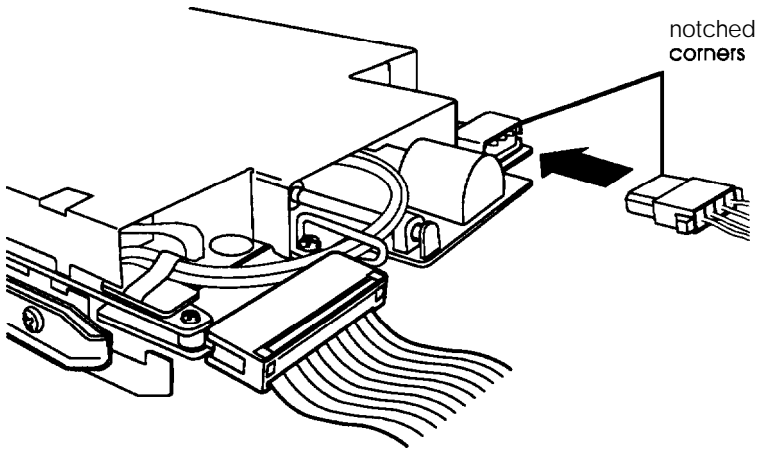
If you are installing a hard disk drive in the upper horizontal bay, make sure you use the proper hard disk drive ribbon cable and connect the drive to the hard disk drive connector. Also, if this is the second hard disk drive in your system, make sure you set the jumpers on both hard disk drives to indicate which is the master and which is the slave drive.

2. If the drive connector extending from the back of the drive has gold contacts on both sides, use the card-edge connector on the ribbon cable. Make sure you align the key-way (the plastic divider) with the gap in the drive **connector**.

If the drive connector contains a series of pins, use the header connector. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1.

3. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)

4. Position the power supply cable connector so that its notched corners line up with the notched corners of the drive's power supply connector. Make sure the holes fit over all the pins and then push in the connector.



Caution

If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

If you installed a diskette drive in the upper bay, it is drive B; the lower drive is A. However, if you want to reassign the upper diskette drive as drive A, you can change jumpers J17 through J20. See Chapter 3 for instructions.

Removing a Drive from the Upper Drive Bay

To remove a drive from the upper drive bay, follow these steps:

1. Remove both the ribbon cable connector and the power cable connector from the drive.
2. Remove the screws securing the drive.
3. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.
4. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently guiding the other side into place. You will hear it snap into place.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover on your computer, you need to run the SETUP program to define the correct configuration for your newly-installed drive. See Chapter 1 for instructions.

Chapter 5

Installing Video Drivers

The Utility diskettes included with your system contain enhanced VGA (video graphics array) drivers and utilities for your computer's built-in VGA adapter. This chapter describes how to install and use these drivers and utilities.

Your computer's built-in VGA adapter is compatible with IBM VGA. The drivers and utilities described in this chapter work with any VGA and compatible, multifrequency monitors that use analog input.

Standard VGA monitors display resolutions up to 640 x 480, and you do not need to install the drivers or utilities for your system to operate properly with your application programs at this resolution.

However, if you want to use resolutions over 640 x 480 or take advantage of the following special features when using certain application programs, you need to install the appropriate drivers:

- ❑ Enhanced graphic and text modes in 4, 16, and 256 colors
- ❑ Resolutions up to 1024 x 768
- ❑ Extended text mode for 132-column text with 25, 30, 43, and 60 rows.

Your computer comes with 256KB of video memory installed on the system board. You can upgrade the video memory to either 512KB or 1MB by installing additional video memory chips, allowing you to use higher resolutions and more colors. See Chapter 3 for installation instructions.

This chapter describes installation procedures for the following common applications:

- ❑ Lotus 1-2-3 and Symphony, version 2.x (see page 5-3)
- ❑ Microsoft Windows, version 3.1 (see page 5-4)
- ❑ Microsoft Word, version 5.0 (see page 5-5)
- ❑ Quattro Pro, version 2.x (see page 5-6)
- ❑ WordPerfect, version 5.1 (see page 5-7)

Your Utility diskettes contain VGA utilities and drivers for additional applications. If you want to install these utilities or an extended video driver for an application not listed above, read the README files on your Utility diskettes. These files will tell you what additional applications are supported and will describe the VGA utilities.

Installing the Drivers

The information in this guide is organized alphabetically by application program or operating environment. To install a particular driver, turn to the page listed above for your application or environment.

Note

Each of the VGA drivers is designed to work with a specific version of software. Make sure the driver you select is compatible with the version of software you are using, or you may get unpredictable results.

Lotus 1-2-3 or Symphony

If you have not yet installed Lotus 1-2-3 or Symphony, follow the instructions in your Lotus documentation to install it. Then follow these steps to install the drivers:

1. Insert Utility Diskette 1 in drive A.
2. Type **A :** and press **Enter** to log onto drive A.
3. Copy the drivers from **the** Utility Diskette 1 to the Lotus or Symphony program directory on your hard disk.

If you are installing drivers for 1-2-3 to the C:\LOTUS directory, type the following and press **Enter**:

```
SET123 C:\LOTUS
```

If you are installing drivers for Symphony to the C:\SYMPHONY directory, type the following and press **Enter**:

```
SETSYMPH C:\SYMPHONY
```

4. Log onto your Lotus program directory.
5. Type **INSTALL** and press **Enter to run the** installation program.
6. From the main menu, select **Advanced** options and press **Enter**.
7. Then select **Add new drivers to library** and press **Enter**.
8. When the program finishes adding drivers to the library, select **Modify current driver set** and press **Enter**.

9. Select Text display to modify **the text** mode or Graphics display to modify the graphics resolution. Then press **Enter**.
10. Select the TVGA driver you want to install from the displayed list and press **Enter**.
11. Select Return to menu and press **Enter**.
12. At the Installation menu, select save changes .
13. At the prompt, type the name you want to use for the driver set and press **Enter**.
14. Exit the Install program.
15. When you start 1-2-3 or Symphony, type 123 or SYMPHONY, followed by the name of the driver set you want to use, and then press **Enter**.

Microsoft Windows

If you have not yet installed Windows 3.1, follow the instructions in your Windows documentation to install it with the standard VGA driver. Then follow these instructions to install the new driver:

1. Log onto your Windows program directory.
2. Type SETUP and press **Enter**.
3. At the System Information screen, select Display and press **Enter**.
4. From the Display menu, select Other (Requires disk provided by hardware manufacturer) and press **Enter**.

5. Insert the Utility Diskette 1 in drive A.
6. Type the following path:

A: \WIN
7. Select the driver you want to install.
8. Follow the instructions on the screen to finish running SETUP.

Note

All Windows driver files are compressed using Microsoft COMPRESS. If you install the drivers to or from a network server, you must expand all driver files by using Microsoft EXPAND. See your Windows documentation for instructions.

Microsoft Word

If you have not yet installed Word 5.0, follow the instructions in your Word documentation to install it. Then follow these instructions to install the appropriate driver:

1. Log onto your Word program directory.
2. Rename the driver file SCREEN.VID to the name SCREEN.OLD.
3. Insert the Utility Diskette 1 in drive A.
4. Copy the SCREEN.VID file from the diskette to your Word program directory. Type the following command and press Enter to copy the file:

COPY A:\WORD\SCREEN.VID

5. Start your Word application.
6. Press Esc to enter a command.
7. Press O to enter an Option command.
8. Select Display Mode.
9. Press **F1** to list the display modes available. Choose one of the following display modes to indicate the number of rows for your display:

```
1 Text, 25 lines, 16 color
2 Text, 43 lines, 16 color
3 Text, 50 lines, 16 color
4 Text, 60 lines, 16 color
5 Text, 25 lines, 16 color*
6 Text, 30 lines, 16 color*
7 Text, 43 lines, 16 color*
8 Text, 60 lines, 16 color*
```

*These are 132-column modes and provide no mouse support.

Press 1 to see additional drivers.

Your Word application now uses the display mode you selected.

Quattro Pro

If you have not yet installed your Quattro Pro application, follow the instructions in the Quattro Pro documentation to install it now. Then follow these steps to install the extended VGA drivers for Quattro Pro:

1. Log onto your Quattro Pro directory.
2. Insert the Utility Diskette 1 in drive A.

3. Type the following command and press **Enter** to copy the new display drivers to your Quattro Pro directory:

```
COPY A:\QPRO\VIDEO.RSC
```

4. Start your Quattro Pro application.
5. Type /O to select the Options menu.
6. Type D to display the available display mode drivers.
7. Select Trident VGA.
8. Select the extended text mode you want to use.

Your Quattro Pro application now uses the display mode you selected.

WordPerfect

If you have not yet installed WordPerfect 5.1, follow the instructions in your WordPerfect documentation to install it. Then follow the instructions below to install the new drivers.

1. Log onto the WordPerfect directory on your hard disk.
2. Insert the Utility Diskette 1 in drive A.
3. Copy the extended text and graphics drivers from the utility disk to your WordPerfect directory by typing:

```
COPY A:\WP51\*.VRS
```

4. Start your WordPerfect application.
5. Press **Shift F1** to display the Setup menu.
6. Select Display.

7. Select Graphics **screen** Type.
8. Choose Trident TVGA.
9. Select one of the extended graphics drivers. Choose from 800 x 600,16 colors; 1024 x 768,16 colors; and 786 x 1024, 16 colors.
10. Now select Text Screen Type.
11. Choose Trident VGA.
12. Select the resolution you want for your text driver.
13. Press F7 to exit. Your selection is saved and used for displaying text as well as the print preview and graphics functions of WordPerfect.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as “The computer will not start.” Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Epson dealer.

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use the following table to locate this information.

Location of system information

| System information | location |
|----------------------|---|
| Serial number | On the back panel of the computer |
| Video BIOS version | On the screen during power-on diagnostics |
| System BIOS version | On SETUP System Information screen |
| System configuration | On SETUP screens |
| DOS version | In response to the DOS VER command |
| Software versions | In application banner screen; in 'About' application window; within application documentation |

The Computer Will Not Start

The power light is on, but the computer does not start.

Replace your main operating system diskette and turn on the computer again.

Caution

If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

The computer does not start and the power light is not lit.

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

The power cord is secure/y connected, but the computer still does not start.

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

You installed or removed system components, and now your computer does not start.

Check to make sure you have reconnected all the internal and external cables correctly.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a reasonable length of time, turn it off, wait 20 seconds, and try again.

You may have installed memory using SIMMs that work at the wrong speed. You can try using the SETUP program to insert a wait state (see Chapter 1) or you can install the correct SIMMs (see chapter 3).

You turned the computer off and on again, but it still does not respond.

Try resetting the computer using the **Ctrl Alt Del** command.

Your computer sudden/y stops operating.

You may have overloaded the power supply limitations. See your option card manual(s) for the power requirements for your option card(s). Then check Appendix A to see if you have exceeded the option slot power limits.

Keyboard Problems

The screen displays a keyboard error message when you turn on or reset the computer.

Make sure the keyboard is securely connected to the correct port.

Nothing happens when you type on the keyboard

See “The Computer Does Not Respond,” above.

The cursor keys on the numeric keypad do not work properly.

If the Num Lock light in the upper right corner of the keyboard is lit, press NumLock to turn off the function.

If you want to change the initial settings of the num lock function, see “Setting the NumLock On at Root” in Chapter 1.

Monitor Problems

There is no display on the screen.

Check that the monitor’s power switch is on and that its power light is lit.

The power light is on, but you still do not see anything on the screen.

Check the brightness and contrast controls.

If you still do not see anything on the screen, make sure you connected your monitor to the computer securely.

If you installed a display adapter card, make sure your monitor and display adapter match. Also check to see if the card's switches or jumpers and the jumpers on the system board are set properly. See Chapter 3 for system board jumper information.

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

Note

If your application program requires a monitor that supports graphics but you have a monochrome monitor, the results will be unpredictable.

The power switch is on but the power light is not on.

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error message.

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a highdensity diskette in a doubledensity drive.

Reinserting the diskette does not solve the problem.

Insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the right type, but you still see an error.

Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something is wrong with the data in the files.

If you are using DOS, use CHKDSK to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly-installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the correct type of diskette drive.

The diskette drive is making loud or unusual noises.

Contact your dealer or service representative.

Hard Disk Drive Problems

A newly-installed hard disk drive is not working properly.

Make sure you have installed the drive correctly and check all cable connections. Also, check the jumper settings on your drive.

You see a hard disk drive error when you start your system.

Run SETUP and update your system configuration for the hard disk drive. Make sure you selected the correct drive type.

Make sure the jumpers on the system board are set correctly. See Chapter 3 for jumper information.

You are unable to Store data on the hard disk drive.

Make sure you have partitioned and formatted the drive correctly for your operating system. Use the procedures provided in your operating system manual.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. If it has not been physically formatted, use the format utility that came with the drive to format it.

Note that a physical format is different from software-based formatting commands, such as the DOS FORMAT command.

You have been using your hard disk drive successfully for some time but notice a reduction in performance.

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

If you cannot access data on your hard disk or you are seeing read/write errors, the disk may have a physical problem. Contact your dealer.

Software Problems

The application program does not start.

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. See Chapter 2 for information on setting the processor speed.

Your application has locked the computer, making it unresponsive to keyboard commands.

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2 Unix, or NetWare 3.11, needs a minimum of 4MB to 8MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add additional memory using the instructions in Chapter 3.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly connected to the computer. Also make sure your printer has paper in it.

Make sure the computer's jumpers J7 and J9 are set correctly.

The printer prints garbled information.

Check the printer manual for the printer's correct DIP switch or control panel settings.

Also, make sure you have the proper drivers installed for your printer.

Option Card Problems

A newly installed option card is not working correctly.

Make sure the option card is installed correctly and is well-seated in its slot. Run the SETUP program to update your computer's configuration after you install the card. Also, perform setup procedures for any software you are using with the option card.

Also, see the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The main system board of your computer may also have some jumpers that must be set for the option card to work properly. See Chapter 3 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see Chapter 2) or inserting a wait state through the SETUP program (see Chapter 1).

You may have inserted an older option card that works at -5 volts. Make sure you install option cards that meet the system's power requirements.

An external device connected to the option card is not working correctly.

Make sure you are using the proper cable to connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 3 for information on installing SIMMs.

Controller Problems

You see a controller error for the hard disk drive controller, the video controller, or the i/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

Mouse Problems

Your mouse isn't working properly or you see an auxiliary device error message.

Make sure the mouse cable is securely connected to one of the serial ports. Also make sure you installed the mouse driver correctly. See the documentation that came with your mouse and Chapter 1 for instructions.

Check jumpers J2, J3, J8, and J10 to make sure they are set correctly.

Appendix A

Specifications

CPU and Memory

| | |
|-------------------------|--|
| 32-bit CPU | Cyrix Cx486SLC, 33 MHz microprocessor with 16-bit data bus |
| Internal cache | 1KB built into microprocessor |
| System speed | High and low speeds available; high speed is 33 MHz, low speed is 8 MHz; speed selection through SETUP program and keyboard commands; zero wait state memory access at high speed; wait states of zero or one selectable through SETUP |
| Memory | 2MB or 4MB RAM standard on SIMMs; expandable to 16MB using 256KB, 1MB, and 4MB SIMMs; SIMMs must be 30-pin, fast-page mode type with 70ns or faster access speed |
| ROM | 64KB system BIOS, video BIOS, and SETUP code located in EPROM on main system board |
| video RAM | 256KB DRAM on main system board; expandable to 512KB or 1024KB using 70ns or 80ns 44256 DIP chips |
| ShadowRAM | Supports shadowing of system and video BIOS ROM into RAM |
| Math coprocessor | Optional Cx83S87-33 coprocessor available |

*Clock
calendar*

Real-time clock, calendar, and CMOS RAM socketed on main system board with built-in battery backup

Controllers

Video

Trident VGA controller on main system board; provides resolutions up to *1024 x 768 in 16* colors

Diskette

Controller on main system board supports up to two diskette drives

Hard disk

Interface on main system board supports up to two IDE hard disk drives with built-in controllers

Interfaces

Monitor

VGA interface built into system board; 15-pin, D-shell connector

Parallel

One standard 8-bit parallel, unidirectional interface built into main system board; 25-pin, D-shell connector

Serial

Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors

Game

One 15-pin, D-shell connector

Keyboard

PS/2 compatible keyboard interface built into main system board; num lock setting selectable through SETUP; 6-pin, mini DIN **connector**

| | |
|-------------------------|--|
| <i>Option slots</i> | Three 16-bit full-length and two 8-bit N-length I/O expansion slots, ISA compatible, 8 MHz bus speed |
| <i>Speaker</i> | Internal |
| <i>Mass storage</i> | Two 3½-inch wide drives (one internal mount) and one 5 1/4-inch wide, half-height drive |
| <i>Diskette drives</i> | 3.5-inch diskette drive, 1.44MB (highdensity) storage capacity |
| | 5.25-inch diskette drive, 1.2MB (highdensity) storage capacity |
| | 3.5-inch diskette drive, 720KB (double-density) storage capacity |
| | 5.25-inch diskette drive, 360KB (double-density) storage capacity |
| <i>Hard disk drives</i> | 3½-inch form factor hard disk drive(s), up to half-height size; the first mounted internally, and second mounted in the horizontal drive bay |
| <i>Other devices</i> | Half-height tape drive, CD-ROM, or other storage device; 5 1/4-inch or 3½-inch with mounting frames |

Physical Characteristics

| | |
|---------------|--|
| <i>Width</i> | 15.6 inches (396 mm) |
| <i>Depth</i> | 14.5 inches (368 mm) |
| <i>Height</i> | 4.1 inches (104 mm) |
| <i>Weight</i> | 15 lb (6.8 kg), without drives or keyboard |

Power Supply

| | |
|------------------------|--|
| <i>Type</i> | 65 Watt, fan-cooled |
| <i>Input ranges</i> | 90 to 260 VAC |
| <i>Maximum outputs</i> | +5 VDC at 7.5 Amps, +12 VDC at 2.0 Amps, -12 VDC at 0.3 Amps |
| <i>frequency</i> | 47 to 63Hz |

Option Slot Power Limits (Total)

| | | | |
|------------------|----------|-----------|-----------|
| Maximum current* | +5 Volts | +12 Volts | -12 Volts |
| For all slots | 4.6 Amps | 1.8 Amps | 0.3 Amps |

- This system does not support older option cards that may require 4 volts.

Video Memory and Supported Resolutions

| Memory | Resolutions | Colors |
|--------|--------------------------------------|-------------------|
| 256KB | 640 x 480 800 x 600 1024 x 768 | 16 16 4 |
| 512KB | 640 x 480 800 x 600 1024 x 768 | 256 255 16 |
| 1MB | 640 x 480 800 x 600 1024 x 768 | 256 256 256 |

Environmental Requirements

| Condition | Non-operating | | |
|---------------------------|---------------------------------------|--|--|
| | Operating range | range | Storage range |
| Temperature | 41° to 90°F (5° to 32° C) | -4° to 140° F (-20° to 60° C) | -4° to 140° F (-20° to 60°C) |
| Humidity (non-condensing) | 20% to 90% | 10% to 90% | 10% to 90% |
| Altitude | -330 to 9,900 ft (-100 to 3,000 m) | -330 to 39,600 ft (-100 to 12,000m) | -330 to 39,600 ft (-100 to 12,000m) |

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system. As new environments become available, these also will be tested.

- MS-DOS 3.3 through 6.0
- DR DOS 6.0
- Novell NetWare 4.0
- Novell NetWare 3.11*
- Novell NetWare 2.2*
- Novell-ELS NetWare level II 2.12*
- Novell NetWare 386 3.1*
- OS/2 2.1
- OS/2 Extended Version 1.1/1.2
- SCO Unix 3.2 V 4.0n
- SCO Xenix V 1.1.2/2.3.3
- SCO Open Desktop 2.0
- SCO Open Desktop V
- Windows 3.1
- Windows 3.0

* File server and workstation.

Available Options

The following list represents only a few of the options supported for this product. Call your nearest marketing location or Epson Direct for more information on specific options.

options

| Option | Product | Product code |
|------------------------------|--|--------------|
| Monitors | 14" VGA monochrome monitor | A880611 |
| | 14" VGA color monitor, 0.39 mm | A804321 |
| | 14" Extended color VGA monitor | A804211 |
| | 17" Professional Series monitor | A804241 |
| | 20" Professional Series monitor | A804341 |
| Keyboards | 101 USA | A800181 |
| | 102 International keyboard | |
| Mouse | 9-pin serial mouse | A880282 |
| Mass storage devices | | |
| Additional diskette drives | 5.25" 1.2MB FDD | A811371 |
| | 3.5" 1.44MB FDD | A811381 |
| Hard disk drives | 80MB HDD w/embedded AT controller | A812001 |
| | 120MB HDD w/embedded AT controller | A811951 |
| | 170MB HDD w/embedded AT controller | A880861 |
| | 240MB HDD w/embedded AT controller | A811991 |
| CD-ROM | Half-height CD-ROM | |
| Tape backup drive | Epson 250MB tape backup unit | A811613 |
| Memory expansion kits | | |
| System memory | 1MB SIMMs (256KB x 9, 70ns, 4 pieces) | A808831 |
| | 2MB SIMMs (1MB x 9, 70ns, 2 pieces) | A808841 |
| | 8MB SIMMs (4MB x 9, 70ns, 2 pieces) | A808631 |
| Video memory | 44256 DIP chips with 70ns or 80ns access speed | |
| Other | | |
| Network cards | Standard network interface card | |
| Math coprocessor | Cx83S87-33 coprocessor | |

Option (continued)

| Option | Product | Product code |
|-----------------|-------------------------------------|--------------|
| Printers | | |
| 9-pin | Epson LX-810, narrow carriage | C016231 |
| | ActionPrinter 2250, narrow carriage | C100011 |
| | FX-870, narrow carriage | C094001 |
| | FX-1170, wide carriage | C095001 |
| | DFX-5000, wide carriage | C112001 |
| | DFX-8000, wide carriage | C030001 |
| 24-pin | ActionPrinter 3250, narrow carriage | C092011 |
| | LQ-570, narrow carriage | C062001 |
| | LQ-860, narrow carriage | C035031 |
| | LQ-870, narrow carriage | C060021 |
| | LQ-1070, wide carriage | C063001 |
| | LQ-1170, wide carriage | C061021 |
| | LQ-2550, wide carriage | L752 |
| Lasers | EPL-8000 | C09001 |
| | ActionLaser 1000) | C108001 |
| | ActionLaser 1000 (2MB) | C108001-2 |
| | ActionLaser 1500 | C108101 |
| Ink jet | Stylus 800 Ink Jet Printer | C106001 |
| Software | | |
| | Microsoft Windows 3.1 | |
| | Epson MS-DOS 5.0, 5.25" diskettes | A807162 |
| | Epson MS-DOS 5.0, 3.5" diskettes | A807172 |
| | MS-DOS 6.0, 3.5" diskettes | A880382 |
| | Epson OS/2, version 2.0 | A807062 |
| | DR DOS 6.0, 3.5" diskettes | |
| | NetWare Lite 1.1, 3.5" diskettes | |

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